

REMARKS

The Applicants respectfully request reconsideration and allowance of claims 1-20 in view of the following arguments.

INTERVIEW SUMMARY

The Applicants appreciate the telephone interviews conducted between January 25 through January 27, 2005, between Examiner Connolly and the undersigned attorney. In the interviews, the power transitioning arrangement set out in Applicants' claims was discussed in detail and the differences between Applicants' claims and Buller et al. (U.S. patent No. 5,737,171, herein referred to as "Buller") in view of Thomas et al. (U.S. patent No. 5,752,011, herein referred to as "Thomas") were clarified. Applicants agreed to submit arguments to further clarify the differences between Applicants' claims and the cited references. No agreement was reached as to the allowability of the claims.

CLAIMS 1-2, 6-8, 10-11, 14, 15, AND 17-18

The Examiner rejected claims 1-2, 6-8, 10-11, 14, 15, and 17-18 under 35 U.S.C. § 103(a) as being unpatentable over Buller in view of Thomas. The Applicants respectfully traverse these rejections on the ground that the proposed combination does not teach or suggest each and every limitation set forth in the claims and on the ground that there is no teaching, suggestion, or motivation in the prior art to make the combination proposed by the Examiner.

Element (c) of Applicants' independent claim 1 requires,

"a cooling system controller for placing the cooling system at the high thermal impedance in conjunction with a gradual transitioning from the high power

1 dissipation level to the low power dissipation level, and for placing the cooling
2 system at the low thermal impedance in conjunction with a gradual transitioning
3 from the low power dissipation level to the high power dissipation level.”

4 Applicants’ independent claim 10 requires similar apparatus limitations and Applicants’
5
6 independent claim 17 requires similar limitations in method form.

7 The Examiner concedes that the Buller patent fails to show any gradual transitioning of
8 power dissipation between a low power dissipation level and a high power dissipation level in
9 response to a change in a power state signal. As shown in Figure 3 of Buller, the Buller patent
10 teaches controlling a fan in connection with an instantaneous switch in a power dissipation level.
11 In particular, Buller teaches turning a fan on when a system processor switches from a low power
12 dissipation level to a high power dissipation level and turning the fan off when the system
13 processor switches from the high power dissipation level to the low power dissipation level. The
14 Examiner cites Thomas to show a processing system that uses a gradual change in power
15 dissipation and suggests that it would have been obvious to modify the system disclosed in Buller
16 by using the gradual change in processor power dissipation taught by Thomas.

17
18 The Proposed Combination of Buller and Thomas Does Not Result in the Cooling System
19 Controller Required by Applicants’ Claims.

20 Even assuming for the sake of argument that there is some suggestion to combine the
21 Buller and Thomas references, the combination would not produce the cooling system controller
22 required in claim 1. The reason for this is that the gradual power dissipation change taught by
23 Thomas is for the purpose of avoiding having to turn a fan on at all. (see Thomas, col. 8, lines
24 55-56). That is, Thomas teaches operating a processor at a given clock rate/power dissipation
25 level until a certain maximum operating temperature is reached and then reducing the clock

1 rate/power dissipation level gradually instead of turning on a system fan to prevent overheating.
2 Applying this teaching to the processing system disclosed in Buller would result in a system in
3 which the maximum processor temperature is controlled by clock rate/power dissipation level
4 rather than by fan operation/change in thermal impedance. Thus, applying gradual power
5 dissipation change rather than forced convective cooling (fan operation) as taught by Thomas to
6 the system disclosed in Buller would not result in a cooling system controller as required by
7 Applicants' claim 1; that is, a cooling system controller for placing a cooling system at a high
8 thermal impedance in conjunction with a gradual transitioning from a high power dissipation
9 level to a low power dissipation level, and for placing the cooling system at a low thermal
10 impedance in conjunction with a gradual transitioning from the low power dissipation level to the
11 high power dissipation level.

12
13 There is No Suggestion in Prior Art to Apply the Gradual Power Dissipation Reduction Taught
14 By Thomas to the Fan Control System Taught By Buller.

15 In order to combine elements from different prior art references under 35 U.S.C. §103(a),
16 there must be some teaching, suggestion, or motivation in the prior art to make the combination.
17 In the present case, the Examiner proposes combining the teaching of Thomas to gradually
18 reduce clock rate in a processor with the system disclosed in Buller for turning a fan on or off in
19 connection with an instantaneous switch between a high power dissipation level in a processor
20 and a low power dissipation level. Thomas does not, however, teach gradually reducing
21 processor clock rate in a vacuum. Rather, Thomas teaches reducing processor clock rate/power
22 dissipation in order to prevent having to turn on a fan to cool the processor. There would

1 certainly have been no reason for one of ordinary skill in the art to incorporate the gradual clock
2 rate/power dissipation level from Thomas into the Buller system since the Buller system deals
3 with turning a fan on or off during the operation of a processing system, while Thomas teaches
4 how to avoid turning on a fan in a processing system. These two teachings from Buller and
5 Thomas are simply incompatible. There is no suggestion in either reference, or elsewhere in the
6 prior art, to combine Thomas's fan operation avoidance method of gradually reducing clock
7 rate/power dissipation level with the fan operation method taught by Buller.

8 For all of these reasons the Applicants respectfully submit that the proposed combination
9 of the Thomas and Buller patents set out in the currently outstanding Office Action is not only
10 improper under 35 U.S.C. §103(a), but also fails to teach or suggest the cooling system controller
11 specifically required in Applicants' claim 1. Therefore, the Applicants respectfully submit that
12 claim 1 is not obvious in view of the proposed combination of Buller and Thomas and is entitled
13 to allowance together with its dependent claims, claims 2 through 9.

14 Independent claim 10 includes a cooling system controller element similar to claim 1, and
15 independent method claim 17 includes similar cooling system control limitations in method
16 form. Thus, the above arguments with respect to claim 1 apply with equal force to claims 10 and
17 17. The Applicants therefore respectfully submit that claims 10 and 17 are also not obvious in
18 view of Buller and Thomas and are in condition for allowance together with their respective
19 rejected dependent claims, claims 11 through 16 and 18 through 20.

1 CLAIMS 4, 9, 12, AND 16 ARE NOT OBVIOUS OVER THE CITED PRIOR ART

2 The Examiner rejected claims 4, 9, 12, and 16 under 35 U.S.C. § 103(a) as being
3 unpatentable over Buller and Thomas as applied to claims 1-2, 6-8, 10-11, 14, 15, and 17-18
4 above, and further in view of Kim (U.S. Patent No. 6,009,005, hereinafter referred to as "Kim").
5 The Applicants respectfully traverse these rejections on the ground that the proposed
6 combination does not teach or suggest each and every limitation set forth in the claims and on the
7 ground that there is no teaching, suggestion, or motivation in the prior art to make the
8 combination proposed by the Examiner.

9 Kim was cited to show that it was known to use a frequency divider bypass. However,
10 the mere disclosure of a frequency divider bypass in Kim does not in any way make up for the
11 deficiencies of Buller and Thomas with respect to the independent claims 1, 10, and 17. Claims
12 4, 9, 12, and 16 do not merely require a frequency divider and divider bypass. As discussed in
13 detail above, the present claims require a controller for controlling the system thermal impedance
14 in conjunction with a gradual transitioning in power dissipation levels. Because Buller, Thomas,
15 and Kim, either alone or in combination, do not teach or suggest this thermal impedance control
16 in conjunction with gradual power level transitioning, the proposed combination of references
17 cannot teach or suggest all of the elements required in the present claims and cannot render the
18 present claims obvious under 35 U.S.C. §103.

19 Further, the Office Action offers no support at all for the combination of Buller, Thomas,
20 and Kim. Absent any teaching, suggestion, or motivation to combine Buller, Thomas, and Kim
21 as proposed by the Examiner, the combination is improper under 35 U.S. C. §103 and should be
22 withdrawn.

1 For all of these reasons, Applicants submit that claims 4, 9, 12, and 16 are not obvious
2 over the proposed combination of Buller, Thomas, and Kim and are entitled to allowance
3 together with the other claims in the case.
4

5 CLAIMS 3, 5, AND 13 ARE NOT OBVIOUS OVER THE CITED PRIOR ART

6 The Examiner rejected claims 3, 5, and 13 under 35 U.S.C. § 103(a) as being
7 unpatentable over Buller and Thomas as applied to claims 1-2, 6-8, 10-11, 14, 15, and 17-18
8 above, and further in view of Bailey et al. (U.S. Patent No. 6,654,898, hereinafter referred to as
9 "Bailey"). The Applicants respectfully traverse these rejections on the ground that the proposed
10 combination does not teach each and every limitation set forth in the claims and on the ground
11 that there is no teaching, suggestion, or motivation in the prior art to make the combination
12 proposed by the Examiner.

13 Bailey was cited to show that it was known that communication within a host system
14 occurs when different ICs within the host system operate using different clocks. However,
15 claims 3, 5, and 13 do not merely require that the processing system include elements operating
16 at different clock rates. Rather, these claims also require a controller for controlling the system
17 thermal impedance in conjunction with a gradual transitioning in power dissipation levels.
18 Because Buller, Thomas, and Bailey, either alone or in combination, do not teach or suggest this
19 thermal impedance control in conjunction with gradual power level transitioning, the proposed
20 combination of references cannot teach or suggest all of the elements required in the present
21 claims and cannot render the present claims obvious under 35 U.S.C. §103.

1 Further, the Office Action does not support the combination of Buller, Thomas, and
2 Bailey. The prior art must fairly teach or suggest the specific combination as claimed, yet there
3 is no teaching, suggestion, or motivation in the record to combine Buller, Thomas, and Bailey to
4 produce the cooling system controller required in claims 3, 5, and 13.

5 For all of these reasons, Applicants submit that claims 3, 5, and 13 are not obvious over
6 the proposed combination of Buller, Thomas, and Bailey and are entitled to allowance together
7 with the other claims in the case.

8
9 CLAIM 19 IS NOT OBVIOUS OVER THE CITED PRIOR ART

10 The Examiner rejected claim 19 under 35 U.S.C. § 103(a) as being unpatentable over
11 Buller and Thomas as applied to claims 1-2, 6-8, 10-11, 14, 15, and 17-18 above, and further in
12 view of Ganfield et al. (U.S. Patent No. 5,815,694, hereinafter referred to as "Ganfield"). The
13 Applicants respectfully traverse these rejections on the ground that the proposed combination
14 does not teach or suggest each and every limitation set forth in the claims and on the ground that
15 there is no teaching, suggestion, or motivation in the prior art to make the combination proposed
16 by the Examiner.

17 Ganfield was cited to show that a clock must be transitioned gradually in order to avert
18 adverse consequences (see OA, pg. 8, para. 19). However, claim 19 does not merely require the
19 step of gradually transitioning a system clock. Rather, claim 19, through its dependency on claim
20 17 requires the step of placing a cooling system for a processing device at a high thermal
21 impedance in conjunction with a gradual transitioning from a high power dissipation level to a
22 low power dissipation level, and placing the cooling system at a low thermal impedance in

1 conjunction with a gradual transitioning from the low power dissipation level to the high power
2 dissipation level. Even if Buller, Thomas, and Ganfield are combined as proposed by the
3 Examiner, the resulting combination fails to teach or even suggest this thermal impedance
4 control step.

5 Further, there is no proper teaching, suggestion, or motivation in the prior art to combine
6 Ganfield with Buller and Thomas. In an attempt to support the combination of Ganfield,
7 Thomas, and Buller, the Examiner indicates at page 8, paragraph 19 of the Office Action that "*it*
8 *would be obvious* to transition the clock in the Buller system gradually in order to avoid any
9 adverse consequences associated with adjusting a clock frequency." (Emphasis added) However,
10 the issue under 35 U.S.C. §103 is not what would be obvious now. Rather, the proper test for
11 combining references under §103 is what would have been obvious to one of ordinary skill in the
12 art at the time of the invention. Applicants respectfully submit that there is nothing in prior art of
13 record in the case that would teach or suggest combining Buller, Thomas, and Ganfield to result
14 in the step of controlling thermal impedance in conjunction with gradual power level
15 transitioning. Absent a proper teaching, suggestion, or motivation in the prior art to make the
16 proposed combination of Buller, Thomas, and Ganfield, the §103 rejection of claim 19 is
17 improper and should be withdrawn.

18 For all of these reasons, Applicants submit that claim 19 is not obvious over the proposed
19 combination of Buller, Thomas, and Ganfield and is entitled to allowance together with the other
20 claims in the case.

1 CLAIM 20 IS NOT OBVIOUS OVER THE CITED PRIOR ART

2 The Examiner rejected claim 20 under 35 U.S.C. § 103(a) as being unpatentable over
3 Buller and Thomas as applied to claims 1-2, 6-8, 10-11, 14, 15, and 17-18 above, and further in
4 view of Lee et al. (U.S. Patent No. 5,414,863, hereinafter referred to as "Lee"). The Applicants
5 respectfully traverse these rejections on the ground that the proposed combination does not teach
6 or suggest each and every limitation set forth in the claims and on the ground that there is no
7 teaching, suggestion, or motivation in the prior art to make the combination proposed by the
8 Examiner.

9 Lee was cited to show that different portions of the system should be powered up or down
10 in different stages to minimize power usage and to avoid power surges and damage to
11 components due to incorrect biasing. Again, however, claim 20 does not merely require the step
12 of powering up different portions of the system in different stages to maximize power usage and
13 to avoid power surges and damage to components. Rather, claim 20, through its dependency on
14 claim 17 requires the step of placing a cooling system for a processing device at a high thermal
15 impedance in conjunction with a gradual transitioning from a high power dissipation level to a
16 low power dissipation level, and placing the cooling system at a low thermal impedance in
17 conjunction with a gradual transitioning from the low power dissipation level to the high power
18 dissipation level. Thus, even if Buller, Thomas, and Lee are combined as proposed by the
19 Examiner, the resulting combination fails to teach or even suggest this thermal impedance
20 control step.

21 In support of the combination of Lee with Buller and Thomas, the Examiner indicates at
22 page 8, paragraph 21 of the Office Action that it would have been obvious to "modify the power

1 dissipation of the different processing elements” in the Buller system in order to minimize power
2 surges and damage to components due to incorrect biasing and power usage as taught by Lee.
3 However, this rationale for the obviousness of combining Buller, Thomas, and Lee still does not
4 address the specific type of combination required to meet the limitations of claim 20. That is,
5 merely citing a rationale to combine references does not provide a rationale for making the
6 specific combination required to meet the limitations of the claim in question. In this case, the
7 Office Action fails to cite any teaching, suggestion, or motivation to combine the teachings of
8 Buller, Thomas, and Lee to perform the step of controlling thermal impedance in conjunction
9 with gradual power level transitioning.

10 For all of these reasons, the Applicants submit that claim 20 is not obvious over the
11 proposed combination of Buller, Thomas, and Lee, and is entitled to allowance together with the
12 other claims in the case.

1 CONCLUSION

2 For all of the above reasons, the Applicants respectfully request reconsideration and
3 allowance of claims 1-20.

4 If any issue remains as to the allowability of these claims, or if a conference might
5 expedite allowance of the claims, the Examiner is asked to telephone the undersigned attorney
6 prior to issuing a further action in this case.

7
8 Respectfully submitted,

9 THE CULBERTSON GROUP, P.C.

10
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